


SCARLETT

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6502

MICROPROCESSORS

The 6502 and Beyond

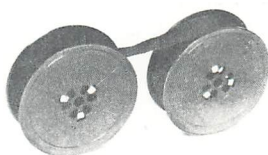
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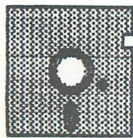
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FROM THE EDITOR'S DISK

BY JOHN WRENHOLT

I thought it would be fun to take some time and reflect back on the year 1984 and give out some awards for the best and worst products.

Best New Program of 1984

No contest here! "Print Shop" by Broderbund is an easy winner. It's USER-friendly, it's fun to USE, and it's USEful. I know of three BRAC members who went out and bought new printers just so they could use "Print Shop".

Worst New Program of 1984

I had to think for a while on this one. I finally settled on the entire "Trilliam Science Software Adventures" line which includes "Fahrenheit 451", "Amazon", and "Rendezvous with Rama". These adventure-type games were co-authored by famous literary names like Michael Crichton, Arthur Clark, and Ray Bradbury. Produced by Spinnaker, these programs had all the ingredients necessary to make a great product. However, someone forgot to hire a good programmer and as a result the whole product line is a disaster.

Best Packaging of a New Product

And the winner is"Trilliam Science Software Adventures".

Although, Spinnaker was too cheap to hire good programmers, they must have spent a fortune designing the packaging.

Best New Game of 1984

Relatively few new games were introduced in 1984 (probably because the game market was saturated in 1983 and a lot of companies went bankrupt trying to market games for the Apple). "Flight Simulator II" by SubLogic has been at the top of the charts almost all year long, but "Archon" by Electronic Arts gets my vote. It combines the strategy of chess with arcade action and either one or two can play. I'm looking forward to "Archon II: Adept" which should be available by April.

Best Educational Program of 1984

A ton of new educational programs were released in 1984. It's my opinion that the educational market has become completely saturated and a lot of the new companies won't have the resources to last out 1985.

Even with all the programs to choose from, I had a hard time coming up with anything that was of exceptional quality. "Robot Odyssey", "Muppet Learning Keys" and "Math Blaster" were all finalists, but I decided to give my vote to

"Music Construction Set" by Electronic Arts.

Biggest Disappointment of 1984

The demise of "Softalk" magazine heads my list. I think that it was the best of the Apple mags and I hate to think about having to rely on inCider and A+ for my Apple information.

Hopes for 1985

In 1985, I hope that someone at Apple, Inc. will realize that Apple's best shot at maintaining its leadership in the computer field, lies not with courting "Fortune 500" companies, but instead by serving its present customers and in extending its lead in the educational, small business, and home markets. In 1984, we watched as Apple tried to change its image from "Apple // Forever" to being the alternative to the dreaded "IBM Syndrome". Steve Jobs obsession with out-marketing IBM could spell big trouble for Apple.

Well that's it for this year. Award winners will receive their prizes in the mail.

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STICKY BEAR READING

REVIEWED BY DIANE WACHHOLTZ

Yes, those famous Stickybear's are back with yet another piece of outstanding educational software for children. Stickybear Reading by Weekly Reader Family Software is geared for children from ages 5 to 8. This program is set-up to help youngsters learn about word recognition and basic sentence building. As usual, the Stickybear package is filled with a little bit of everything. It comes complete with program disk, parent guide (instruction manual), "Stickybears' Scary Night" paperback storybook, poster, and stickers.

Stickybear Reading can run on an Apple][+, //e, or //c, however, use of a color monitor adds to the program immensely. You are also given the choice at the beginning of the program to use the keyboard, joystick, or mouse. They would all work equally well because there are only simple selections to be made, reaction time is not essential.

There are three different programs to choose from: Match the Words, Find the Word, or Build a Sentence. You would probably want to start your child on Match the Words as that is the easiest of the three. Match the Words gives you three different pictures on the left-hand side of the screen and their corresponding names on the right-hand side of the screen. Your child must select a word and then the matching name. If the choice was correct there is a pleasant sound made and the connecting line becomes a solid line. The line will continue to blink and an unpleasant sound is heard if the choice was incorrect. After the correct choices for all three pictures have been made the screen is cleared and the same three pictures with their names are shown so the child can associate the correct two together. Just hit the space bar to continue to the next screen of pictures and names. When the child has mastered that level, or just wants to move

on, hit ESC and the main menu will appear.

Find the Word is next on the menu as it is designed to find the missing word in a given sentence. On the screen there appears a sentence at the top with one word missing. Under the sentence are three words to choose from and on the bottom are the Stickybears and their friends who act out the correct sentence for you. After they have acted out the sentence the choice of the missing word takes place. It follows closely with the previous game as the incorrect word gives an unpleasant sound and the correct word gives a pleasingly triumphant sound. After the correct word is chosen the complete sentence appears at the top of the screen and the players act out the sentence once again. Once this is complete a new sentence will then appear.

Build a Sentence is not only used to help children learn basic sentence structure, but it also helps to nurture the child's imagination. In this program the screen is divided into 4 parts. The top part is labeled START. This is used to act out the sentence after all the choices have been made. Next comes the three different parts containing choices for the noun, verb, noun structure of the sentence. Choices are made by moving the cursor to your selection and pressing the space bar. (As you

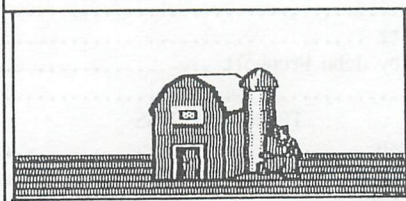
move the cursor through the choices given, their picture will appear at the side of the screen on that particular section.) After all three selections have been made, move the cursor back up to START and press the space bar. The new sentence that was created will then be acted out by the Stickybears and their friends. When the children are ready for a new set of choices they simply press RETURN. ESC will take them back to the main menu.

Those are basic outlines for each of the three programs that make up Stickybear Reading. The storybook that is included in this software package "sums up" the lessons that are taught by these programs. Children use the skills that they have learned through their letter and word recognition.

Overall, I think that for a basic educational program Stickybear Reading is an exceptional tool to use. With the graphics that are used this program helps to hold the child's attention so they enjoy, and learn, from the program. For those of you with young children, Stickybear Reading would be a valuable addition to your software library.

Stickybear Reading by Weekly Reader Family Software retails for \$39.95. BRAC has is available for \$26.00 with a group purchase number of XE04.

Stickybear runs past
a barn.



→ start

Stickybear

The rabbit

Sara

bounces past

jumps over

runs past

a chicken

a skunk

a barn

TIPS ON LODE RUNNER

BY ALBAN GASS

If you ask an Apple game addict what his five favorite games are, chances are pretty good that he will name a version of "Lode Runner" among his choices. The reason why this game is so attractive for so many people is that it combines dexterity and logic in a very exciting manner. In fact, the game designers allow players the ability to choose the proper amount of manual dexterity to suit the individual player's taste.

Most intellectual games have been abstracted to such a degree that the realism of combat attack and defense are lost to the visual scenes, but this is not true with "Lode Runner." The graphics are good and the player sees his man run, climb, jump, and swing hand over hand to try and alternately trap and escape from guards that protect gold stored in the 150 different levels of the basic game. If this is not enough diversity, there is a game editor supplied with the original game that is extremely easy to use and allows you to make your own levels of the game.

I have 68 player generated levels of this game. If someone would like a copy of these additional levels or has made some additional levels that you would like to donate, send me a disk at 1017 Conway Rd., Fredericksburg, VA 22405 and include a stamped addressed mailer large enough for me to return your disk. Any additional playable levels I receive, I will combine with mine and distribute to others.

The attack pattern that is needed to obtain all the treasure on a level is not always apparent; considerable enjoyable time can be spent reasoning out the proper approach. The sequence of levels is laid out so the complexity increases as the experience of the player grows. For that reason, I strongly suggest that you start by becoming very familiar with the basic game, "Lode Runner", before advancing to the newer more advanced version of

the game called "Championship Lode Runner."

Since many of the levels in the advanced version are quite ingenious and some players may appreciate a little encouragement with these complex levels, I have included tips on several levels of the Championship version of the game. If you are the type of player who feels this type of advice would spoil your fun, please skip the next three paragraphs.

Lode Runner™



Level 9 has a triangular-shaped dungeon in the very center of the screen with five guards chasing you. That is just too many guards to be following you around, especially when you have to end up collecting the last treasures on the lower right hand side of the screen. The solution is to get all the treasures out of the center dungeon and then imprison the guards there by having them closely follow you up to the apex of the dungeon from the left side. Just before the guard gets there, blast off the top two blocks and then rush down the other side as he falls thru the hole and imprisons himself for the rest of the time you are on that level. After doing that to a few guards you can peacefully go around the level picking up the remaining treasures.

Level 15 is one of those prima levels that makes you truly admire the originality of the person who

designed it. Eight ladders hang across the top of the screen with treasure at the top of them. Take the gold from all the ladders but the last one. Then free the guard that has fallen into the trap with the treasure, get his treasure and allow him to escape down the slope. By the time you are playing these levels, this type of maneuver should have been mastered. If you follow the guard at the right distance, he will run all the way to the bottom next to another guard. You can then run over both guards' heads to climb up the ladder again and pick up the remaining treasure and win that level!

Two techniques that I had not seen before appear on the 19th Level of "Championship Lode Runner." One is that there is enough time after a block starts to materialize to allow you to blast out a block two below it, run up a ladder, run over the newly created block, fall to the bottom of the wall, pick up the gold, blast a hole in the floor, and escape thru the hole before the block you blasted to start the sequence rematerializes to entomb you. The second technique is that it is possible to blast a block away on both sides of an imprisoned guard while standing on his head and get away from him, if you blast and run with the proper sequence. You will need both of these tricks to get through this level.

Broderbund Software has done their usual superior job in producing this two game series for the Apple. However, a player should progress thru the series in the normal order, so as not to become frustrated.

"Lode Runner" is published by Broderbund and has a retail price of \$34.95. BRAC has it available for \$27.00 as a group purchase special and its product number is BS12. "Championship Lode Runner" is available for the same price and its product number is BS05.

ASSEMBLY CORNER

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REVIEW

Last month I showed you a simple loop, using the x-register as a counter. I also explained how labels are used in an assembler to stand for the addresses of various routines. I presented a complete program, with assembled code, comments, the works. I expect it looked a little strange to many of you. You'll get used to it quickly, believe me!

THE 6502 IN ALL ITS SPLENDOR

I've been slowly revealing the workings of the 6502 so as not to confuse you with too much information at once, but now I feel it's time to give you a complete diagram of the chip, so that you can begin to understand the overall picture a little better. Examine the diagram shown in figure 1.

This is a representation of all the 6502 registers. You are already familiar with the accumulator, the X register, and the Status register. The Y register is very similar to

the X register, with a couple of different commands available. The Program Counter keeps track of where in memory the program is actually executing. It is rarely necessary to adjust it in any way, it pretty much takes care of itself. The stack pointer keeps track of a very special area of memory called, of course, "the stack." I won't go into it this month, but basically the stack is where all the return addresses are stored when a JSR is executed, so that the 6502 will know where to return to when it encounters an RTS. There's more to it than that, but for now it's all you need to know.

I just want you to get a feel for the whole 6502, as you can see, it isn't really very complicated (heh heh), just a few registers, right?

ADDRESSING MODES

So far, we have put our data into the accumulator directly, using the "immediate" mode, like this:

LDA #\$00 or whatever

The "#" indicates that the following value is to be loaded directly into the accumulator. In machine code it appears like this:

A9 00

There are several other ways to load the accumulator. We can load the accumulator with data which is stored in memory, rather than with a fixed value. For instance,

LDA \$2000

will load the accumulator with the CONTENTS of memory location \$2000. The contents of \$2000 is not changed. This is called "absolute" addressing, and in machine code it looks like this:

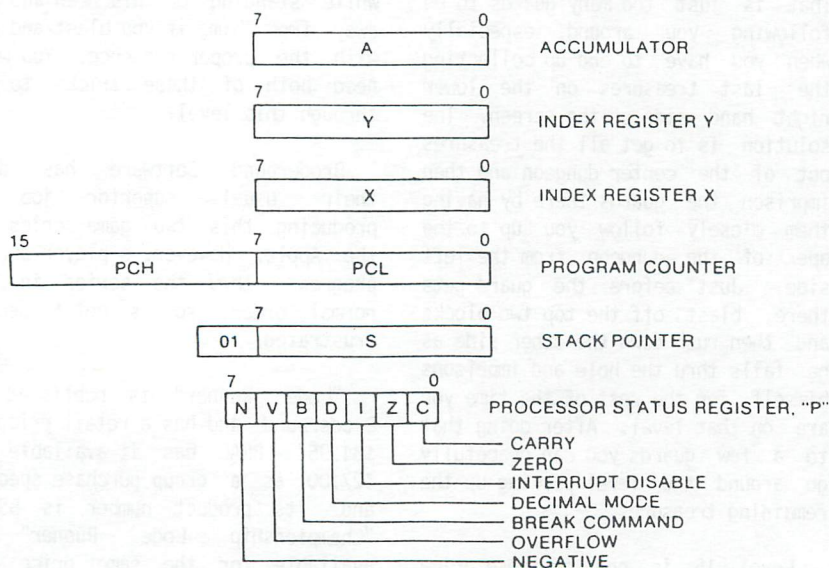
AD 00 20

Notice two things - first of all this instruction takes three bytes, and second, the address is stored in memory low byte first. This is just the way the 6502 works. Addresses always appear low byte first! Remember that.

ASCII

Data stored in memory is generally of two types, either binary data of some kind, such as opcodes or number values, or text. Text is stored in a coded form called ASCII, which stands for American Standard Code for Information Interchange. Each alphabetic and numeric character has been given a 7-bit binary code. The eighth bit is NOT USED in the standard ASCII code. This can cause a bit of confusion when you are starting out, because the Apple does use the eighth bit. As far as standard ASCII is concerned \$8D and \$0D are the same, because the eighth bit is not used. However, the Apple usually operates with the eighth bit set on all characters in memory, so that the characters all have values greater than or equal to \$80. Then again, Applesoft strings are stored

PROGRAMMING MODEL



with the high bit clear. Aren't computers fun! For now, we will use "high" ASCII, with the eighth bit set.

I don't have room this month for a complete ASCII chart, but there is one in your Applesoft reference manual on page 138. Check it out (it gives all the codes for standard 7-bit ASCII).

INDEXED ADDRESSING

Let's say we have some text stored in memory at \$2000, and extending to \$2030. We want to print it on the screen. How can we do it? Using what we know so far, we could do something like this:

```
LDA $2000
JSR $FDED
LDA $2001
JSR $FDED
LDA $2002
JSR $FDED
LDA $2003
JSR $FDED
...etc
LDA $2030
JSR $FDED
RTS
```

Not too efficient perhaps, but it would work just fine. This is called "straight line coding," and it is FAST, but takes lots of memory. In fact, the program to print the data would take five times as much memory as the data itself. Index registers to the rescue!

The X register and the Y register are also called "index registers," because they can be used as indexes from specified memory locations. That means that the contents of the index registers can be added to a base address to obtain a specific address. Probably the best way to clarify this is with an example.

Instead of laboriously specifying each and every address, we can use \$2000 as a base address, and the contents of the X register (or Y register) as an index, or offset, to be added to the base address. This is coded in the following manner:

```
LDA $2000,X
```

The contents of the X register will be added to \$2000 to get the address of the data to be loaded into the accumulator. If the X register contains \$04, the accumulator will be loaded with the data in \$2004. If the X register contains \$FE, the accumulator will be loaded with the data in \$20FE. This is called "absolute indexed addressing." In machine code it looks like this:

```
BD 00 20
```

Can you see a way to use the loop concept along with absolute indexed addressing to accomplish our task? Examine the in listing one.

This is a very commonly used method of retrieving stored data. Notice how a zero is placed at the end of the data as a marker. Notice also the \$8D. This is the ASCII code for a carriage return. There is a limitation to this method, however. Because the index registers cannot contain any value greater than \$FF, the largest number of bytes which can be addressed in this manner is 256. In our example above, we could address \$2000-\$20FF.

Remember the "wrap-around" effect we encountered last month. If you add 1 to \$FF the value of the register will return to zero, because it cannot contain \$100, so the \$1 is lost!

NEXT MONTH

I covered a lot of ground this month, I hope I'm not going too fast. Let me know how you're doing. I think you are just about to the stage where I must go deeper into numbering systems. You're getting too far advanced to neglect it much longer. So get ready for the onslaught! Hexadecimal, here we come. Binary, look out! Next month I'll be explaining in more detail how the computer uses numbers.

Until then, experiment a little with absolute indexed addressing. Create your own tables of data, and see if you can print them on the screen. See if you can figure out a way to print more than 256 bytes (Hint: just write a few more lines of code!). Till next time,

God bless

```
1000 *S.ABSOLUTE.INDEXED.ADDRESSING
1010 *-----
1020 * An example of absolute indexed addressing
1030 *-----
1040 .OR $1FF1
FD00- 1050 COUT .EQ $FDED The monitor print routine
1060 *-----
1070 START LDX #0 Start with zero in x register
1080 .1 LDA TABLE,X Get one character from table
1090 BEQ .2 End of table marked with a zero
1100 JSR COUT Print it on the screen
1110 INX Point to next character
1120 JMP .1 Go do another character
1130 .2 RTS All done
1140 *-----
2000- D4 C8 C9
2003- D3 A0 C9
2006- D3 A0 C1
2009- CE A0 C5
200C- D8 C1 CD
200F- D0 CC C5
2012- A0 CF C6
2015- A0 C1 C2
2018- D3 CF CC
201B- D5 D4 C5 1150 TABLE .AS -/THIS IS AN EXAMPLE OF ABSOLUTE/
201E- 8D 1160 .HS 8D
201F- C9 CE C4
2022- C5 D8 C5
2025- C4 A0 C1
2028- C4 C4 D2
202B- C5 D3 D3
202E- C9 CE C7 1170 .AS -/INDEXED ADDRESSING/
2031- 00 1180 .HS 00
```

0000 ERRORS IN ASSEMBLY

TIPS AND HINTS

EDITED BY DIANE WACHHOLTZ

We have something for everyone this month thanks to all of our members who have sent in their letters for this column. Dick Armstrong from New Jersey starts us off with helpful tips for those of you who have ProDOS or DOS 3.3 and aren't sure exactly what to do with it. The following are his suggestions for their use:

SAVING FILES TO NON-DEFAULT DRIVES

Recently, many first time computer users are getting Apple //c's or //e's with ProDOS which they don't understand and DOS 3.3 which they don't know why they need.

They do not know how to move files around, how to format or save, and drive 2 is inaccessible to them! Unfortunately, they are receiving very skimpy documentation. We created the following mini-tutorial

at the Computer Learning Center to help teach them how to save files on the second drive.

PROGRAM EDITING TIPS

Ed Aymond of Texas has this to add to Lynn Jone's suggestion from the December column:

Your December issue talked about the blank line that sometimes appears in text lines of an Applesoft program which Lynn Jones explained very clearly and listed a demonstration program that was interesting.

Here is a method I use that may not be known to everyone for writing program introduction and instructions. Start the line as usual with the PRINT followed by the quote mark ("); then go into the "Edit" mode by pressing ESC, drop

down a line with "M"; go over to the left edge of the screen with "J"; press any key to get out of the Edit mode. Then start typing your Text and type it the way you want it to appear on the screen when the program is RUN. Don't forget to close with the quote mark. Do not get carried away with typing as about 5 lines is all you can get.

My second tip is based on something I first saw this in Baron's Microcomputing Reports written slightly different. See listing 1 for my version which I enter as lines 1 and 2 on any program I'm writing, editing or entering from a magazine. Then after making changes or whatever, I can merely type RUN and the program is SAVED, LOCKED and RUN without having to type the program name each time.

Tutorial: SAVING FILES TO NON-DEFAULT DISK DRIVES

Assumptions: Default drive is Slot 6 and Drive 1
second drive is Slot 6 and Drive 2
Note: Any numbers are valid here Slots 1 to 7 and Drives 1 and 2
including RAM DISK ... Slot 3 Drive 1 !

using DOS 3.3

1. Load (boot) DOS 3.3 System Master Disk via Slot 6, Drive 1 (S6,D1)
2. LOAD HELLO
3. install blank disk in Slot 6, Drive 2
4. INIT HELLO,S6,D2
5. SAVE TEMP,S6,D2
6. CATALOG,S6,D2 (no spaces)

YOU have now saved a file on the non-default disk drive!
You will find that Sn,Dn should work when appended to the following DOS commands:

FP	EXEC	CHAIN	CATALOG
INIT	DELETE	RENAME	LOCK
UNLOCK	VERIFY	RUN	LOAD
SAVE			

using ProDos

1. Load (boot) ProDos User's Disk
2. insert blank disk in S6,D2
3. select F (File utilities)
4. select V (Volume utilities)
5. select F (Format)
enter Slot 6
Drive 2
type new volume name as STATE (return)
destroy"XXX"?(Y/N) Y
press escape
press escape (again)
press Q to Quit
press return
press B for Basic
6. Enter: 10 PRINT "This is a ProDos initialized disk created via Slot 6 disk drive 2!"
20 END
7. SAVE CITY,S6,D2
8. CAT,S6,D2 (no spaces)
9. RUN (smile!)

```
1 Q7$ = "TEST7" : REM CHANGE TO YOUR  
PROGRAM'S NAME  
2 PRINT CHR$(4)"MONCIO": PRINT  
CHR$(4)"UNLOCK "Q7$: PRINT  
CHR$(4)"SAVE "Q7$: PRINT CHR$(4)"  
LOCK "Q7$: PRINT CHR$(4)"  
"NOMONCIO"
```

LISTING ONE

I used Q7\$ as the variable for my program name because it was the least likely to be used elsewhere in the program.

MORE EDITING TIPS

We also received another suggestion to supplement Lynn's article from Mike Elias of Goodland, KS:

The two solutions suggested to eliminate the problem are not complete in case one doesn't want to add one or more blank spaces to the line or reword the sentence.

The professional solution is very simple. Simply add a semi-colon after the last quote mark. Type in the program in listing two to see what I mean.

```
10 TEXT:HOME
20 FOR X=1 TO 3
30 PRINT "*" THIS LINE HAS FORTY CHARACTERS IN IT.*:NEXT
40 FOR X=1 TO 3
50 PRINT "*" THIS LINE HAS FORTY CHARACTERS IN IT.*:NEXT
```

LISTING TWO

Line 50 is the correct way to eliminate the blank line following the 40 character line. In fact, it can eliminate counting the characters in a line. If you ever think the line is close to 40, simply insert the semi-colon whether you need it or not. It won't hurt anything.

Hope this helps some programmers out there.

BOOKENDS REVIEW

continued from page 15

writing things like term papers or articles would be especially valuable. Using the classification entry field (if you've made consistent entries) you can specify one format for magazines, one for books, and another for encyclopedias -- Tarubian would love it!

You can also save parts of a list to a new file and save files in DOS 3.3 text format for use by a word processor or transmission through a modem. There are also simple utilities that can be used to edit, merge, and append files. When the database becomes too large for your memory you can continue it in a new file and chain the files together. The number of files that can be chained is unlimited so your database size is not limited by machine memory.

"Bookends" is an excellent program with a variety of potential uses. The reasons for the 4.5 rating were the problem I had on first boot and the inflexibility of entry fields. I would have liked to

be able to change the names of the fields a little. Regardless of this, I can still recommend the program highly for its ease of use, quick retrieval of information, and general versatility.

MICROPROCESSORS

continued from page 9

programming the 68516, I don't recommend this route.

The other way you can get started with 68516 is to buy a 68502 chip.

These are available in limited quantities for about \$50 to \$100. One source of this chip is Alliance Computers, P.O. Box 408, Corona, NY 11368 (718) 672-0684. The 68502 is an eight bit version of the 68516. Although it is missing some of the 68516's capabilities (most notably, the ability to address up to 16 MB of memory), most of the new opcodes function just like they do on the 68516. Best of all, the 68502 is plug-compatible with either the 6502 or 65C02. Just remove the current chip in either your Apple][+ or Apple //e and install the new 68502. Your Apple is now a state-of-the-art computer.

Which ever route you chose to take, you'll need a good assembler which is capable of handling 68516 code. I suggest the "S-C Macro Assembler Version 2.0" by S-C Software. You can order directly from S-C Software for \$100 or order it from BRAC for only \$80. The product number is SC65. The S-C Assembler is also capable of compiling 65C02 or 6502 source code.

THE ACCELERATOR //e

Another improvement which is based on new chip technologies is the "Accelerator //e" card for the Apple][+ or //e. The "Accelerator" is a card which plugs into any peripheral slot and will make most of your current programs run approximately three and a half times faster with no modifications. It does this by using a CMOS 6502 MPU running at 3 1/2 MHz. This replaces the Apple's 1 MHz 6502 processor for all computation. The "Accelerator" contains 80K of fast (150 ns) RAM on the card. It uses this memory instead of the RAM on the

motherboard so that it can access the memory without slowing down. It also copies the ROM language into its fast RAM so that whatever language you are using can operate at full speed.

A pre-boot disk is included in the package which allows you to run time sensitive programs at their normal speed. To disable or slow down the "Accelerator" first boot up the Apple with the pre-boot disk. Then insert the disk with whatever program you wish to use and press control-reset. The "Accelerator" will then be disabled and the program will operate at normal speeds.

The "Accelerator" card also has a block of dip switches which allows you to slow down the card whenever you are accessing a peripheral slot which has a time-sensitive device such as a disk drive or modem. These switches are set just once when the card is installed and then can be forgotten.

I've had the "Accelerator" installed in my Apple //e for almost a month now without encountering any problems with software compatibility. It even works with programs like AppleWorks which use all 128K of memory. For games and our disk-copying program, we must first use the pre-boot disk to disable the card but this hasn't seemed to be a great inconvenience to us. The speed increase hasn't been all that useful with the software programs that we have been using such as AppleWriter and AppleWorks since these programs spend a large portion of their time just blinking the cursor waiting for us to input something. However, for people who use large spreadsheets or who run big Applesoft Basic programs, the "Accelerator" should greatly reduce the time they spend waiting on the computer. The "Accelerator //e" has been available at a special introductory price of \$319, but I believe the price has now been raised to \$599 retail. If you are interested in purchasing an "Accelerator" card, check with us about the pricing. The "Accelerator //e" is made by Titan Technologies, Inc, 310 West Ann, Ann Arbor, MI 48104. Phone (313) 662-8542.

MICROPROCESSORS: THE

In 1976, a young man named Steve Wozniak hurried towards the Wescon computer show in San Francisco. He had heard that a company called MOS Technology would be selling a new microprocessor chip for only \$20. This MPU (MicroProcessing Unit), the 6502, was to become the heart and soul of a new computer called an Apple I. Wozniak's choice of the 6502 was based almost entirely on economics since most MPU's at the time cost hundreds of dollars. However, in retrospect, he probably couldn't have made a better choice for although there are other chips which are more powerful and complex, the 6502 has a very simple instruction set which is easy to learn and it also has a very versatile set of addressing modes. This allowed enterprising programmers to write thousands of fast and powerful software programs for the Apple.

Since that time, the Apple I has undergone many changes and improvements; becoming first the Apple II, then the II+, then the IIe, and finally the IIC. The 6502

has also been upgraded and today all new Apples being manufactured contain an improved version called the 65C02. And looking into the not too distant future, one can easily envision a time when the 65SC802 and 65SC816 chips will be the MPU of a new Apple // product line. If you're in a hurry, don't wait for Apple, Inc. You can upgrade your Apple II+ or IIe right now!

WHAT IS AN MPU?

Before we go any further, let's take a moment to explain to some of our less experienced members what microprocessors are and how they work. Although computers have a reputation for being intelligent, in fact, they are very dumb. The Apple // computer with a 6502 MPU has a repertoire of only 56 distinct instructions that it can carry out. All computer programs are, at their lowest level, sets of these 56 different instructions arranged in such a manner so as to perform the desired task. It is the MPU's job to fetch the next instruction from the current program and then carry

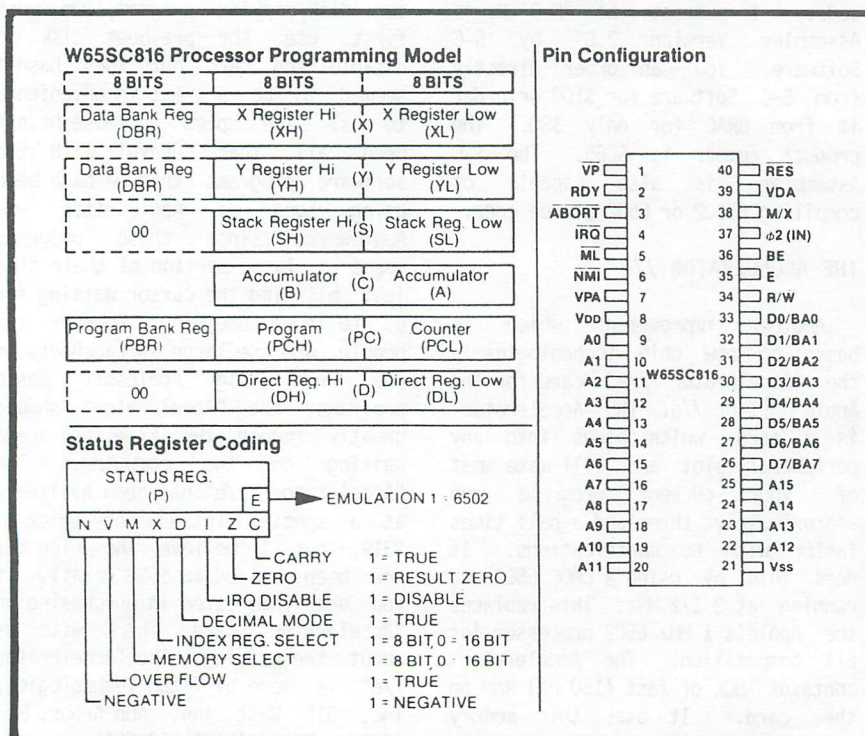
it out. For even the most simple program, the MPU will probably have to perform its job thousands of times. Fortunately, for us, the MPU is very fast at what it does (in fact, it takes the 6502 slightly less than seven microseconds to perform its most complicated instruction).

THE 65C02 MPU

The 65C02 MPU (all Apple //c's have this chip) functions identically to the 6502, except that eight new instructions have been added and some minor "bugs" have been corrected. For those of you who have been following Jan Eugenide's "Assembly Corner", the new instructions are PHX, PHY, PLX, and PLY (push and pull the X and Y registers from the stack), BRA (branch always), STZ (store zero), TSB and TRB (test and set bits). The 65C02 is also manufactured by a different process called CMOS which allows them to use less power.

UPGRADING YOUR APPLE

If you want to, you can install a 65C02 in your Apple II+ or Apple IIe. Buy either the 1 MHz or 2 MHz version. MHz stands for megahertz and designates the speed at which the MPU runs. Faster versions of the 65C02 are available but your Apple's memory is too slow to keep up with them. A new 65C02 chip will cost about \$10 and you can order one from most mail order electronic parts suppliers. I bought mine from Jameco Electronics, 1355 Shoreway Road, Belmont, CA 94002, phone (415) 592-8097. Use a chip puller to remove your old 6502 and then carefully install the new chip. Chips are very sensitive to static electricity, so be sure to ground yourself by touching the Apple's power supply before picking one up. Apple II+ owners may also have to replace the two 74LS257 chips at B6 and B7 with 74F257's (also available from Jameco for \$1.79 each). This solves a timing problem which occurs in some older Apple's.



6502

AND BEYOND

Let's assume that you've just installed the new 65C02 chip in your Apple. What's going to happen when you turn it on and boot up a disk. Well if you did everything correctly, you won't be able to tell the difference. All programs which worked on your computer with the old chip should still work and any programs which didn't work before, still won't work. Also, don't get the idea that plugging in a 65C02 will speed up your old software or make your computer any more compatible with the Apple //c. Double hi-res, the 128K memory, and mouse-text aren't in anyway connected to which chip you use. Only assembly language programmers will be able to get any advantage from the 65C02.

APPLE READIES UPDATE KIT

It has been reported in a number of publications that Apple is preparing an enhancement kit for Apple //e owners. This kit, which consists of a NCR 65C02 chip, two new monitor ROMs (CD and EF) and a character generator ROM, is designed to reduce any differences between the //e and the //c. Software products for the //e and //c can then be developed that use interrupts, graphic icons, and pull-down menus. If you upgrade your //e with this kit, you will notice some improvements which are due largely to improved coding in the monitor ROMs. The eighty-column scroll has been greatly speeded up, escape key functions are handled properly and you can print the mouse-text graphics on the screen. Apple hasn't made an announcement as to when this product will be available or what the price will be, although from an inside source I learned that all new Apple //e's will have the enhancement.

THE APPLE //x

According to rumors, Steve Wozniak is working on a new computer which the media is referring to as the Apple //x. This computer will

be compatible with most existing Apple software but will be based on a 16-bit MPU called the 65816. This chip, which was developed by Western Design Center, has a special emulation mode which allows it to be completely compatible with 6502 or 65C02 code. Since the 65816 has the ability to address up to 16 megabytes (16384K) of real memory, the Apple //x would be capable of running application software that would rival the best produced for any other microcomputer including the IBM-PC. But the real power of the Apple //x would come from the 65816's ability to perform sixteen bit math, use stack relative addressing modes, and dynamically locate page zero. This makes the 65816 excellent for writing modern compilers for high level languages. The Apple //x is definitely a product that could revolutionize the entire microcomputer industry. Now you know why Apple's motto is "the Apple // forever!".

APPLE 16 AND 68502

If you can't wait to get your hands on an Apple //x (if such a product is ever released) and if you know some assembly language there are two ways you can get a jump on the rest of the crowd and get started working with the 68516 now! The first way is to buy an add-on card which contains the 65816 and up to 256K of add-on memory. The card is available in limited quantities from a company called ComLog at 11056 N 23rd Drive Suite 104, Phoenix, AZ 85029. Their phone number is (602) 248-0769. This card, called the Apple16, costs \$395.00 plus you will have to buy your own DRAM memory chips for it. No software comes with the card so unless you are really serious about

continued on page 7

Table 3. Addressing Mode Summary

Address Mode	Instruction Times In Memory Cycles		Memory Utilization In Number of Program Sequence Bytes	
	Original 8 Bit NMOS 6502	New W65SC816	Original 8 Bit NMOS 6502	New W65SC816
1. Immediate	2	2 ⁽³⁾	2	2 ⁽³⁾
2. Absolute	4 ⁽⁵⁾	4 ^(3,5)	3	3
3. Absolute Long	—	5 ⁽³⁾	—	4
4. Direct	3 ⁽⁵⁾	3 ^(3,4,5)	2	2
5. Accumulator	2	2	1	1
6. Implied	2	2	1	1
7. Direct Indirect Indexed (IND), Y	5 ⁽¹⁾	5 ^(1,3,4)	2	2
8. Direct Indirect Indexed Long (IND), Y Long	—	6 ^(3,4)	—	2
9. Direct Indexed Indirect (IND, X)	6	6 ^(3,4)	2	2
10. Direct, X	4 ⁽⁵⁾	4 ^(3,4,5)	2	2
11. Direct, Y	4	4 ^(3,4)	2	2
12. Absolute, X	4 ^(1,5)	4 ^(1,3,5)	3	3
13. Absolute Long, X	—	5 ⁽³⁾	—	4
14. Absolute, Y	4 ⁽¹⁾	4 ^(1,3)	3	3
15. Relative	2 ^(1,2)	2 ⁽²⁾	2	2
16. Relative Long	—	3 ⁽²⁾	—	3
17. Absolute Indirect (Jump)	5	5	3	3
18. Direct Indirect	—	5 ^(3,4)	—	2
19. Direct Indirect Long	—	6 ^(3,4)	—	2
20. Absolute Indexed Indirect (Jump)	—	6	—	3
21. Stack	3-7	3-8	1-3	1-4
22. Stack Relative	—	4 ⁽³⁾	—	2
23. Stack Relative Indirect Indexed	—	7 ⁽³⁾	—	2
24. Block Move X, Y, C (Source, Destination, Block Length)	—	7	—	3

NOTES:

1. Page boundary, add 1 cycle if page boundary is crossed when forming address.
2. Branch taken, add 1 cycle if branch is taken.
3. M = 0 or X = 0, 16 bit operation, add 1 cycle, add 1 byte for immediate.
4. Direct register low (DL) not equal zero, add 1 cycle.
5. Read-Modify-Write, add 2 cycles for M = 1, add 3 cycles for M = 0.

GROUP PURCHASE SPECIALS

BLANK DISKS

Last month's sale on blank disks turned into a real barn burner! We sold all 10,000 disks in less than two weeks. Needless to say we ordered another 10,000 and we continue offering them to club members at these prices for as long as we can. These are single-sided, double-density bulk disks which are manufactured by Syncom. They are track-certified and include Tyvek sleeves, labels, and write-protect tabs. We have been using them for Disk.Networks and public domain software with absolutely no problems. Prices include all shipping and handling.

Here is the pricing schedule:

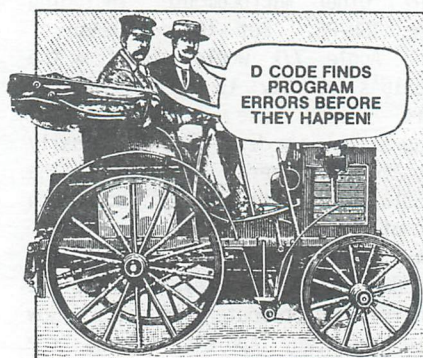
Number of Disks	Price Per Disk
1 to 9	\$1.50
10 to 39	1.10
40 to 99	.99
100 to 499	.95
500 to 999	.92
1000 or more	.89

DISK DRIVES

If you been debating about whether to buy a second disk drive, here's an order that could greatly influence your thinking. We've made arrangements to sell disk drives by American Mitac Company. After testing one of their drives for the past three months, we have decided that the product's quality is good and the prices are unbeatable! Apple II and Apple //e owners will want to order product number AM01 for \$152.00. It will plug into the drive 2 portion of your disk controller card with no additional hardware. Apple //c owners will need to order AM02 for \$175.00. This is a white-colored, half-height drive which can be added to the //c via the auxilliary disk drive port on the back panel. All the special cabling is included.

NEW BEAGLE BROS SOFTWARE

The Beagle Bros. have released two new software packages which we will be reviewing in next month's issue of "Scarlett". "D-Code" is a Applesoft programmer's utility disk which contains a sophisticated program tracer, a REM statement re-mover and program cruncher and several other useful tools. It is available from BRAC for \$30.00. Order number is BB15.



"I.O. Silver" is a hi-res game which is a cross between a strategy game and an arcade game. You try to push microcomputer chips together to form a super computer. Deep thinkers will probably enjoy this game more than those who rely on fast reflexes. Order number is BB16 and BRAC price is \$21.00. Both "D-Code" and "I.O. Silver" include tips and hints booklets and are not copy-protected.

ELECTRONIC ARTS

We have the complete line of Electronic Arts software products available.

Dr J and Larry Bird Go One on One: This is an action-packed basketball game where you play as either Dr J or Larry Bird. Good fun, but takes some coordination. Requires joystick. EA01-\$31.50.

Music Construction Set: Use a joystick or mouse to "cut and paste" notes and music symbols onto the staff. Then play back your composition on Apple's speaker or

via the Mockingboard. EA02-\$31.50.

Archon: This game will remind you of chess, but only until you start playing it. Whenever you capture a piece, you must fight for the square. Gets my vote for best new game of the year. Requires joystick. EA03-\$31.50.

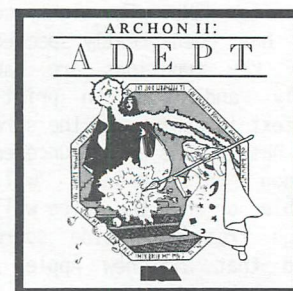
Pinball Construction Set: Design your own hi-res pinball games using a mouse or joystick to "cut and paste" bumpers, side rails, and flippers. Is it more fun to create your own game or to play with? EA04-\$31.50.

Financial Cookbook: An easy-to-use, but sophisticated home financial calculator. Covers taxes, savings, investments, IRA's, mortgages, and other common financial schedules. EA05-\$40.50.

Sky Fox: A game of flying and fighting to protect your home base from invasion. EA06-\$31.50.

Seven Cities of Gold: An exploration game set in the 16th century world of the Spanish Conquistadors. Historically and geographically accurate. EA07-\$31.50.

Murder on the Zinderneuf: A mystery novel in computer graphics. EA08-\$31.50.



COMING SOON! "Archon II: Adept": An action-packed strategy game with new magic, icons, battlefields and more. Available March 1985. EA09-\$31.50.

Big Red Apple Club
1105 South 13th, Suite 103
Norfolk, NE 68701

YOUR SIGNATURE

City, St _____

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- 1) Make checks or money orders to the Big Red Apple Club, 1105 South 13th, Suite 103, Norfolk, NE 68701.
- 2) Payment should be made in U.S. funds drawn on U.S. or Canadian banks.
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- 4) Nebraska residents add 3 1/2% for sales tax. If you are tax exempt, please provide I.D. number for our records.
- 5) We try to ship your order within two days. We will notify you if we are unable to do us.
- 6) Prices quoted include handling and shipping to U.S. or Canada.
- 7) We need a street address so that we can ship via UPS. This saves us money and it gets to you faster.
- 8) Prices are subject to change without notice.

PRODUCT REVIEWS

SEASTALKER

Reviewed by Scott Stratman
Reprinted from
Apple-Dayton Dec 1984

"The alarm sounds. You know there is something terrifying in the depths of the ocean below. You've got to face up to it. Now only you can save the Aquadome, the world's first undersea research station. Your specially equipped submarine, the Scimitar, is ready. But wait -- You haven't even tested the Scimitar in deep water, and the crew of the Aquadome may have a traitor in its ranks. It looks as if this adventure won't be easy. In fact, if you challenge the deep without charting the right course, you might wind up as shark bait!" (A quote from the publishers of "Seastalker", Infocom).

>LOOK AT THE SONARSCOPE
(+=YOU, .=OPEN WATER, *=OBSTACLE)

```

          DEPTH:ORANGE
* . . . * * * * *
* . . . * * * * *
* . . . * * * * *
. . . . . HEADING:E
```

Fig. 1 The Scimitar's Sonarscope

So you like adventure games, but you could never really solve them? Well this game may be just what you are looking for. "Seastalker" is designed for ages 9 and up and is designated as a Junior Level adventure. It is the first of a series of adventure games produced with the beginner in mind. In its attempt to cut down piracy of its games, Infocom has come out with some innovating packaging ideas. The cover is brightly designed and the following can be found inside; a Submarine Logbook, (which is a users manual), eight Infocards, Infocard decoder film (used to reveal clues), a nautical chart of Frobtan Bay, and a Discovery Squad sticker.

If you've ever wanted to live out Jules Verne's 20,000 Leagues Under The Sea, here's your chance. In "Seastalker" you command an experimental submarine, the Scimitar, on a voyage to the

Aquadome, an undersea laboratory. You start off the adventure in your laboratory trying to figure out how to operate the Scimitar. Solving this leads you into the bay where you must navigate the many hazards and escape to the open sea. The trip to the Aquadome is rather uneventful with only a small problem or two. It is at the Aquadome that the final phase of the adventure is solved.

"Seastalker" is, in the tradition of other Infocom adventures, all done in text. "Seastalker" uses the conventional vocabulary such as N, S, E, W, U, D and includes some special commands such as script (tells the printer to start making a transcript of the story), unscript (turns printer off), and verbose (has "Seastalker" display everything about a place or thing each time you see it).

There are a few other additions that make this adventure more interesting. The Scimitar is fully equipped and includes a sonarscope, depth finder, dart gun, and many other features. The sonarscope is unique because of the display screen upon which *'s and .'s are produced, representing barriers and open water. The sonarscreen is quite helpful in navigating the Scimitar.

Also new is Infocom's way of giving away clues without revealing too much. There are eight Infocards included in the packaging. These have three clues on each card and various information concerning the people you will meet and the items you will find in the adventure. With the decoder film you can reveal valuable hints and you don't have to pay extra for it.

All in all, "Seastalker" is an excellent novice adventure but anyone with experience will probably find it too easy and not as enjoyable as some of the more challenging adventure games. However, if the clues are not used the adventure can be made somewhat

challenging. One aspect of the adventure that really disappointed me was that after arriving at the Aquadome, the death of anyone terminates the adventure because the culprit makes a full confession. This generally ruins any enjoyment and or interest you might have had in the adventure.

"Seastalker" by Jim Lawrence, Infocom, List Price \$39.95. (BRAC's price is \$31.50 with the product number of IF01.)

FAHRENHEIT 451

Reviewed by Freddie Temple

Ray Bradbury's classic science fiction novel about a future society where all books are banned and burned has been made into an adventure game for the Apple //. FAHRENHEIT 451 is great as a book, but this game is rather mediocre.

It can be played on any Apple // computer with at least 64K RAM. The game combines hi-res graphics, sound and text. The graphics add a nice touch to what would otherwise be a dull game. The sound can be turned off at the beginning of the game. The adventure plays just like any other text adventure but there are pictures to go along with the game.

The adventure adheres to the plot of the novel and reading the book is helpful in gaining clues to your success. The object is to find books and protect them from extinction. The setting is New York City and there are several adversaries who try to stop you.

A major objection I have to this game is that it is very slow. Everytime you move from one place to another a new picture is slowly drawn at the top of the screen. It's also slow in analyzing your commands. The commands you type in can be full sentences. Also, the game is on two double sided disks and you must often change disks which slows the game even further.

I'm sure Trilliam Software could have made Fahrenheit 451 a better game. That the game's storyline closely follows the book is the only thing I found favorable about it. So if you don't mind playing a slow adventure game and enjoy science fiction stories, Fahrenheit 451 may be for you.

Fahrenheit 451 is copyrighted (C) 1984 by Trilliam Software. Retail price is \$39.95.

SKYFOX

Reprinted from
Mahoning Valley AUG

Protected arcade game for one player. Joystick required; game enhanced by Mockingboard sound effects. Color monitor or TV greatly preferred. List price \$39.95.

"Skyfox" has a simple theme: the aliens have landed and it's us or them! You are in control of Skyfox, a new, experimental aircraft being developed at a space colony. The aliens land, and you are the only thing that can stop them. But don't be worried, as Skyfox is the *meanest* plane I've ever seen! The play of the game is simple. You control lateral and vertical movement of Skyfox with the joystick. Button 1 gives you a boost of speed. Button 0 fires. If you type G (for guided) or H (for heat-seeking), you'll fire one of your missiles (you've 5 of each). Otherwise, you'll fire lasers which are, fortunately for you, unlimited and rapid-fire. Pressing both buttons at once turns on your auto-pilot, and your ship starts heading towards the nearest enemy at top speed. Keys 0-9 control speed otherwise, and C activates the base Computer (undoubtedly an Apple 2000-XXX). So playing the game is simple.

The problem is that there isn't enough of you! The map is very large, with friendly installations in several places, and the alien motherships can start most anywhere. From these motherships come tanks and planes. If you're at a low altitude, you'll fight the motherships and tanks. Climb higher, and you'll go through a

cloud bank to fight the planes. And you'll have to get rid of them fast; if the motherships aren't destroyed quickly, you'll soon be overrun as they produce more and more 'bogies'. Fortunately, if your base station remains intact, you can call up the master computer screen. This keeps track of your bases and their stats, all aliens, and can even zoom in on map squares to show exactly where the little buggers are. And if you move the cursor over a square and hit A, your autopilot will take you there. Good players will use the computer often to keep track of their bases and enemy movements.

"Skyfox" is great in the graphics and sound department. The graphics are fast, colorful, and accurate. It's really amazing to see what can be done with an 'outdated' Apple computer with the poor graphics hardware designers sometimes complain about. The sound effects are only so-so, though, unless you've a Mockingboard installed. Then the game really comes alive with explosions, laser and gun fire, and even jet engines.

Best of all, "Skyfox" offers no less than five training scenarios, with no motherships or bases to defend, and several different skill levels. There are several invasion scenarios with motherships, ranging from a small invasion to a massive onslaught. There's certainly enough in "Skyfox" to keep you busy for quite a while. "Skyfox" is the best arcade game to come out in a long while.

"Skyfox" by Electronic Arts is available from BRAC for \$31.50. Its Group Purchase product number is EA06.

SUMMER GAMES

Reviewed by Russell Roman

"Summer Games" by Epyx has 8 challenging competitions with events such as pole vaulting, 100-meter dash, 4 by 400-meter relay, gymnastics, and skeet shooting which all takes place on land. The pool events are freestyle relay, 100-meter freestyle relay, and freestyle diving. Not only does this program have a variety of events, but it also has accompanying

graphics and sound which make the events even more realistic.

Although in some events you have to jiggle with the joystick, other events require precision with the joystick. For example, in the freestyle diving if you pull out of the dive a fraction of a second to late then the difference is between a perfect "10" and a painful splash.

Before you start the competition the program begins with the outstanding opening ceremonies which has the releasing of doves and has the lighting of the torch. Next a window appears with your choices. You can view the "world records" which are your personal best efforts. If you decide to compete, then you get to choose one of 18 nations to represent. The program will play yours and nine other person's national anthems before the competition. The program finishes by tallying up the scores and playing the national anthem of the gold medalist. "Summer Games" deserves a gold medal.

"Summer Games" by Epyx retails for \$40.00. You can order it from BRAC for \$29.00. The product number is EP01.

FINGERPRINT PARALLEL INTERFACE

By Wes Dickey

Reprinted from S.N.A.C.K.

At the December meeting it was announced that we would be getting a "FingerPrint" interface to look at. It arrived just before Christmas and I had a chance to play (and work) with it.

The card is a standard graphics parallel card with one main exception. The exception is a cable with a small button that runs to the outside of the computer. With most any program running, a simple push of the button stops the program allowing you to get a print-out of the current graphics or text. I used this feature with a few pieces of commercial software as well of some of my own work.

The first protected program I selected was "Print Shop". With a push of the "FingerPrint" button and '3' I had dumped the main menu to my

printer, a touch of the 'O' key and I was back to "Print Shop". I proceeded through the various menus printing most. I found it easy to alter the print-out to double-size and rotated and then back again to normal size.

Knowing the "AppleWorks" does not work with all interface cards, it was my next target. The 80-Column text dump worked perfectly when I pushed the button. The next problem would be to see if "AppleWorks" could print. I loaded a file and printed it, (fully expecting to see strange things on my paper as I had so many times before with different cards.) The print-out looked fine so I tried the screen dump option in "AppleWorks". It worked too. I tried various other print-out options with no trouble.

My next target was low resolution graphics. Again I was happy with the results. By the way, few graphics cards will print low resolutions graphics. The "FingerPrint" does not do everything with low resolution graphics that my "Pkaso/U" will, but it does enough for most people.

Print-outs from "Logo" also were a breeze using "FingerPrint".

In conclusion, I think that if I were in the market for an interface card today, I would be very tempted to get "FingerPrint" from Thirware computer products. The card will do everything (I think) that the "Grappler" card will do. The commands it uses are not 100% compatible with the commands for the "Grappler" card, but are close. "FingerPrint" does have more options than the "Grappler". I mention "Grappler" only because so many people are familiar with it and many of the graphics cards on the market are nothing more than "Grappler" work-alikes. This card does not fit that category. I feel it is much more flexible and can meet the needs of more people.

GRAPHMAX

Reviewed by Wes Dickey
Reprinted from S.N.A.C.K.

"Graphmax" is a "Grappler work-alike" printer interface card

with some notable improvements. Dip switches are set to support the following printers. Epson (MX-80, MX-100, FX-80, FX-100), NEC 8023, C. itoh Prowriter, I.D.S. (Paper Tiger 460, 560 Prism 80, 132), Okidata (82A, 83A, 84, 92, 93), Anadex, Mannesman Tally MT-160, and MPC. If the printer supports color, there is a color version of "Graphmax".

One feature that I like about "Graphmax" is its ability to 'crop'. There are times when I want a print-out of only part of my graphics. With this feature I can select and print only a portion of the screen. Another nice feature is the 'zoom' printout. This feature allows the user to enlarge the printout to almost any size. If you were to 'crop' your graphic to 1/4 its original size, then it would be possible for you to 'zoom' in on this part and get a full page printout.

It is also possible to make the card 'transparent' to the graphics commands if your software disagrees.

The card seems to support "AppleWorks" with no problems. "Graphmax" is made by Micromax and has a retail price of \$119.00. You can order it from BRAC for \$80.00. Product number is MX03.

ONE ON ONE

Reviewed by Crickett Townsend
Reprinted from S.P.C.A.

I was given the chance to play basketball the other day. I learned it is not that easy to play, especially when the other player is a computer. No, I didn't take my Apple to the court, it was done by using a software package called "One On One" by Electronic Arts.

My friends booted the disk and used the joystick to choose the game type and who would play, while I finished the dishes. The graphics are kind of neat. Though I do not have a color monitor I could easily tell the difference between the players. The game board has one basket and a free throw circle. That information was supplied by my roommates since I had made mention of a hoop with string hanging from it and lines

painted on the floor, a half circle with a straight line on the outer edge.

The game started and suddenly the computer's player started bouncing the ball (dribbling) towards the basket. Stunned, I just watched as he tossed the ball through the hoop. The roar of the pleased crowd sounded in the background. Players then returned to the line, again the computer player took off, this time I moved. I found by pressing the button I could make my player jump, used for making touchdowns (shooting), and to tackle (steal) the ball. I discovered it looks pretty strange when you're next to the line jumping up and down and the other player is next to the basket making a score. After watching the score for the computer's side go up and up, I finally managed to get the ball away from the computer player.

Now what to do with the ball? I started to move, I went one way then another. The whistle blew, I had been holding the ball too long, or running when I was holding the ball or something. Back to the line. Later I had the ball once more. When I started to move, I heard that whistle again and then a umpire (referee) came running out and said offensive charging.

I was ready to call it quits when the guys told me they had picked the hardest game possible. They re-booted and chose the easy game for my next try. I then discovered there are four different skills, and three modes of play. Two players may play each other instead of the computer. The easy-to-use menu lets you select either two joysticks or a joystick and the keyboard. You can also select which keys will move in which directions. If you choose to use the keyboard, after each score you change positions, joystick moves to keyboard and vice versa. That keeps one player from having an advantage due to the device used to move his man. The program is menu driven and very easy to select the items you want for each game. You can also select possession of the ball i.e., winners out or loser out, and who you will be during the game, Larry Bird or Dr. J. (Julius Erving). You can play a timed game

or to a set score.

This time it was just a game between friends, if you can consider a guy who made a score of over a hundred to zero a friend. This level is called PARK & REC, the other selections are VARSITY, COLLEGE and PRO, each making the computer a better player.

I was able to get the ball and even tried throwing it through the basket. The first few times it didn't go but as time went on I learned how to somewhat maneuver around and even scored. Sometimes you will see an instant replay of the last point scored. This helped me to see just what I was doing wrong. It's hard to see what you should have done while you are making the move. You do know it was wrong though when you see the computer's score jump up once more.

Even though I don't believe I could ever get serious about basketball, I found the game to be challenging and a lot of fun. Those little guys on the screen move with such grace from the front of the court to the back, running, jumping and turning to and fro. Even if you can't score its fun to watch. It seems to be a great way to learn to see dimensions and depth, and improve co-ordination. The score I made would never set a record, but with practice I hope to challenge my friend, and maybe someday win. If you like action, whether you understand basketball or not I think you will enjoy this game. "One on One" has a retail price of \$40.00 and is available from BRAC for \$31.50. Order number is EA01.

BOOKENDS

Reviewed by Carolyn Parks
Reprinted from Apple Dillo

SUMMARY

Program: Reference Management System
Publisher: Sensible Software
24011 Seneca
Oak Park, MI 48237
Purpose: Information storage and retrieval
Equipment Required: APPLE II w/48K RAM memory & Applesoft in ROM or

APPLE II w/64K RAM and one disk drive, 40-column display screen.
Optional Equipment Supported:
Printer (up to 136 columns), 2nd disk drive, or 16K memory expansion card, lower case adapter chip, shift key modification, upper/lower case keyboard. Suggested Retail Price: \$ 124.95. BRAC Club Price \$80.00. Order number SS03.

Rating on a Scale of 1 to 5: 4.5

For a couple of years I've been trying to keep track of articles in computer magazines using my 40-column version of the PFS database software. While the system works, as my files have grown I've come to wish I could use all 80-columns of my //e screen and could somehow speed up retrieval of information. After my review of "Bookends" I believe that it's a great alternative for indexing a multitude of information - including my index of computer articles.

The "Bookends" program does have a pre-set format that can't be altered as a database program can, but the pre-set format can be used for many different applications with just a little imagination and is easy to use and flexible in retrieval and output of data. The "Bookends" program can be used for indexing books, movies, software, research articles, and practically any other non-numeric file you can think of that needs to be cataloged or organized.

The program recognizes the capacity of the APPLE's memory on booting. The manual that comes with "Bookends" has an excellent tutorial that moves smoothly through the functions of the program. I did have one problem with the tutorial when I began. Looking for a "keyword" in the file that I was instructed to load brought back zero (0) matches when, according to the manual, there should have been four. Since I needed the matches to continue with the tutorial I was stuck. I reloaded the file and tried again with the same result. I then tried rebooting the program (both cold and warm) with the same result. Finally, I set the program

aside (it was evening) and called Sensible Software the next day. They assured me that there had been no change in the program since the manual had been printed and asked me to try again. This time the program worked as the manual said it should. Since I had received the package sealed in plastic, had not done anything to alter the information, and have had no similar problems with my computer and other software there is a possibility that something in the program can occasionally cause a problem.

The "Bookends" format contains an entry field for author, title, journal, volume, pages, data, publisher, keywords, abstract, and classification. Entry is easy to do with simple tabbing from field to field. There is a maximum of 255 characters in most fields. The abstract field allows 740 characters - plenty for any use I might have for it. You can also input multiple entries in almost all entry fields so, for instance, multiple keywords can be entered.

"Bookends" retrieval is done through keyword searches just as with other popular database programs. But "Bookends" is intelligent enough to ask questions if your keyword/phrase seems questionable. For instance, in an index of software with descriptions of what the software does entered in the abstract section, retrieval using the word "keyword" might produce several database packages. To narrow the field "keyword/phrase" could be used for the retrieval question. "Bookends" will ask if all the records with "keyword" in them and all the records with "phrase" in them are desired or if only those records with both "keyword" and "phrase" are wanted. This type of intelligence makes the program even easier to use and superior to some database programs.

Output can be printed in any format you wish -- list of authors only or any combination of entry fields you wish. This is where using the "Bookends" program for storage of research material when

CONTINUED ON PAGE 7

APPLESAUCE

BY REGGIE GATES

dBASE-II FOR YOU ??

One of the reasons for my recent implementation of CP/M was to try out dBASE-II, the popular data base manager offered by Ashton-Tate. (As I understand it, dBASE-II is available on the Apple only under CP/M). I'm so pleased with the results that I'm going to devote this whole column to why you might want to consider using dBASE for your next data processing application.

dBASE-II is sometimes advertised as a data base system, but I prefer to think of it as a "command language". (I realize that this may upset some of the language purists out there, but please bear with me for the duration of this column).

DBASE LANGUAGE IS MUCH MORE POWERFUL FOR DATA MANIPULATION THAN BASIC.

Why, you ask, do we need to learn another language when we already have Applesoft? The answer is that the dBASE language is much more powerful for data manipulation than BASIC. The general structure of a dBASE command is

VERB Scope Field(s) Conditional
Expression

an example would be

```
LIST Next 10 Name,City For  
Area="213"
```

LIST is the verb, "Next 10", restricts the "scope" of the verb to the next 10 records in the file, "Name,City" are the fields to be listed, and "For Area="213"" specifies a condition that must be true for the LISTing to be done.

Why Is This Better?

To get a glimpse of the power of the dBASE approach, here is the

equivalent BASIC code for the command above.

```
100 FOR I= 1 TO 10  
200 GOSUB 9000:REM READ REC INTO R$  
300 X=0:IF MID$(R$,100,3)="213" THEN  
X=1  
400 IF X=1 THEN PRINT  
MID$(R$,1,25),MID$(R$,55,20)  
500 NEXT I
```

Since the dBASE code is a single command, it can be issued in the "immediate" mode directly from the keyboard. But more than that, the dBASE code is easier to read and understand, and therefore easier to write and debug.

Let's look at the "weak points" of the BASIC code above and try to predict where it might fail. To me the most suspect statements are the MID\$ referring to the record in R\$. We will probably mis-count the record positions and refer to the wrong field, e.g., pick up the last byte of City and the first two bytes of Area Code when we want to compare to Area Code only. We don't have the "opportunity" to make this mistake in dBASE.

Go Data Dictionary

The ability to manipulate fields by their names instead of their character positions is provided by a simple data dictionary built into dBASE. For each dBASE file, the user is required to declare the name, type (numeric or character) and length of all the fields in the file. This makes possible several very nice features of dBASE-II.

For example, suppose we want to lengthen the Name field from 25 characters to 30 characters for the file above. In the BASIC situation, we would have to go through all our programs that refer to the file and change the R\$ references to the Name field AND the R\$ references to all fields following the Name in the record (such as Area Code). In addition, we would have to write a conversion program to change the

existing file to the expanded version.

In dBASE, we copy the data dictionary for the old file to a new file and modify the length of the Name field. (We can also insert new fields in the file, if desired.) Then, with a single command, we can copy all of the data from the old file to the new. Now we can run all of your programs using the new file without changing the field references in the programs!

But Wait - There's More

One of the implications of the use of a Data Dictionary is that the dBASE commands will operate on any file that have the fields needed by the commands. In other words, the command given above needs the Name, City and Area fields to be present in the file. We could use the same command against a file of Customers, a file of Sales Leads, or Rental Properties, just so long as these three fields are present. This suggests that we can write one program (to generate mailing labels, say) and have it work with different files without any changes.

And Full-Screen Editing

One of the most powerful features of dBASE-II is that it can use the data dictionary to provide full-screen editing of a file. Once the file has been defined, the EDIT command uses the field names to build a full-screen layout for entering or changing data. The operator can use pre-defined control key sequences to move from field to field or from record to record to edit or enter data into the file. The same function would require an elaborate set of BASIC statements.

Index, Anyone?

Any character field in the file can be indexed, that is, with a single command dBASE will build a auxiliary file that can be used to access the file's records in a

different order. Suppose you wish to print mailing labels in zip code order from a Customer file that is already in sort by name. Suppose also that we already have a label print program called Labels. Then the following dBASE commands will do the job.

USE Cust (opens the Customer file)
INDEX ON Zip TO ZINDEX (Builds the zip code index)
USE Cust INDEX ZINDEX (Opens the Customer file in Zip order)
DO Labels (Executes the label printing program)

Briefly

Here brief descriptions of some other dBASE features.

- Deleted records can be "brought back" before being purged
- New files can be made from old and fields added, changed or deleted in the process.
- Files can be "merged" together by matching key fields
- Building menus for a "menu-driven"

application is easy

- The structured programming concepts of "Do While", "Do Case", and "If-Then-Else" are implemented.

And Some Drawbacks

Here are some of the negative considerations for dBASE-II.

1. It is expensive. You are almost required to have two drives, one for dBASE and one for your data. In addition, you must have CP/M, 64K, and an 80-column card. This may be an addition to the purchase prices of dBASE-II, which has been discounted in my area to about \$300.

2. The error messages can be confusing. Sometimes you are better off saying "I know something's wrong - what could it be?" than trying to decipher the error message that you get.

3. Some combinations of commands have been reported to fail. Fortunately, these are rather unusual combinations and there seems to be alternatives to using them.

4. dBASE-II can be slow in response, depending on what you're doing (and what commands are used).

5. There is no way to "name" a routine in a dBASE program and branch to that portion of the program. In other words, there is no corresponding dBASE command to the GOSUB statement. The DO command will execute another program, but it always reads the "target" program from the disk. This can slow an application down quite a bit.

If you are interested in learning more about dBASE-II but don't want to spend the \$300 to purchase it right away, you might get the book "dBASE-II User's Guide" by Adam Green. It's a fairly readable introduction to the language, complete with examples.

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